FBI Approved Standards for Scientific Testimony and Report Language For Forensic Geologically-derived Materials Examinations

1 Purpose

This document provides examples of scientifically-supported conclusions and opinions approved for reporting examination conclusions and offering expert opinion statements during testimony by Geologist/Forensic Examiners within the Mineralogy Group of the Trace Evidence Unit (TEU). These examples are not intended to be all inclusive. The actual statements that may be provided in a particular case may be subject to prior legal precedent in the locality in which a testimony is provided. Further, these examples are not intended to serve as requirements for other forensic laboratories and do not imply that statements by other forensic laboratories are incorrect, indefensible, or erroneous. Explanations supporting the statements contained in this document can be found in the FBI Laboratory Quality Assurance Manual, FBI Laboratory Operations Manual, Trace Evidence Quality Assurance Manual, Trace Evidence Procedures Manual, and current reliable references

2 Scope

This document applies to Geologist/Forensic Examiners within the TEU Mineralogy Group who prepare FBI *Laboratory Reports* (7-1 or 7-1 LIMS) and/or provide testimony in the area of forensic geologic materials (e.g., soil, rocks, minerals, gemstones), or geologically-derived materials (e.g., bricks, concrete blocks, ceiling tile), and unknown materials of suspected geologic origin. For the purposes of this document, geologic materials, geologically-derived materials, and unknown materials of suspected geologic origin will be collectively referred to as "geologically-derived materials."

3 Statements Approved for FBI TEU Mineralogy Group Forensic Geology Comparisons Testimony and/or Laboratory Reports

For additional guidance on report writing, see the Trace Evidence General Approach to Report Writing.

3.1 Fracture Fit: An Examiner may assert that the geologically-derived materials were once part of the same broken object. This conclusion can only be reached when two or more geologically derived materials physically fit together and show sufficient correspondence between their macro- and microscopic characteristics to indicate they once comprised a single object, and insufficient disagreement between their macro-and microscopic characteristics to conclude that they originated from different objects.

3.2 Fracture Fit Exclusion: And Examiner may assert that two or more broken glass fragments do not physically fit together. This conclusion can only be reached when the macro- and microscopic characteristics of two or more pieces of broken glass do not correspond.

3.3 Inclusion: An Examiner may assert that the possibility that the geologically-derived material(s) originated from the same source as the known exemplar cannot be eliminated. Additional geologically-derived material(s) that are indistinguishable in all assessed characteristics could also be potential sources. This conclusion is reached when the material(s) cannot be differentiated from the exemplar using all observed or measured characteristics, there is sufficient quantity of material for reliable and reproducible results, and no inseparable mixing or deleterious change is indicated.

3.4 Inconclusive: An Examiner may assert that no determination can be reached as to whether or not the geologically-derived materials could have originated from the same source. This conclusion can be reached for several reasons, including insufficient quantity for either the material or the exemplar, when there is inseparable mixing with other sources of geologically-derived materials, or when there has been deleterious change of the item(s) or exemplar.

3.5 Exclusion: An Examiner may assert that the possibility that the geologically-derived material(s) originated from the same source as the exemplar is eliminated. This conclusion is reached when the material(s) can be differentiated from the exemplar, there is sufficient quantity of material for reliable and reproducible results, and no inseparable mixing or deleterious change is indicated.

3.6 An Examiner may assert the approximate limits of the areal extent of a geologic body based on published map data**.**

4 Statements Not Approved For FBI TEU Mineralogy Group Forensic Geology Comparisons Testimony and/or Laboratory Reports

4.1 An Examiner shall not assert that two or more geologically-derived materials were once part of the same broken object unless they physically fit together.

4.2 When offering a “fracture fit” conclusion, an Examiner shall not assert that the geologically-derived materials originated from the same object to the exclusion of all other objects.

4.3 An examiner shall not use the terms “individualize” or “individualization” when describing a “fracture fit” conclusion or a “fracture fit exclusion.”

4.4 An examiner shall not assert that a “fracture fit” conclusion or a “fracture fit exclusion” is based on the “uniqueness” of an item of evidence.

4.5 An Examiner shall not offer an "inclusion" conclusion unless they explain that the geologically-derived materials could also have originated from additional geologically-derived sources that are indistinguishable in all assessed characteristics.

4.6 An Examiner shall not assert that a geologically-derived materials exemplar is representative of all geologically-derived materials in the area of interest.

4.7 An Examiner shall not assert that the boundaries of a homogenous geologically-derived material can be predicted with absolute certainty.

4.8 An Examiner shall not assert that the total number of objects within a group of similar geologically-derived materials can be predicted with absolute certainty.

4.9 An Examiner shall not assert that forensic geologically-derived materials examinations are infallible or have a zero error rate.

4.10 An Examiner shall not provide a conclusion that includes a statistic or numerical degree of probability except when based on relevant and appropriate data.

4.11 An Examiner shall not cite the number of forensic geologically-derived materials examinations performed in their career as a direct measure for the accuracy of a proffered conclusion.

4.12 An Examiner shall not use expressions "absolute certainty," "100% certainty," "reasonable degree of scientific certainty", "reasonable scientific certainty", or similar assertions of reasonable certainty in either reports or testimony unless required to do so by a judge or applicable law.

5 Laboratory Report Reviews

The content of a Mineralogy Group *Laboratory Report* will be reviewed per the appropriate FBI Laboratory Operations Manual practices and the Trace Evidence Casework Assignment and Review Procedures to ensure compliance with the approved statements in this document.

6 Testimony Reviews

Mineralogy Group testimonies will be reviewed following the FBI Laboratory Operations Manual, Practices for Testimony Related Activities. The review will assess the testimony for compliance with the statements in this document.

7 References

- FBI Laboratory Quality Assurance Manual (current version)
- FBI Laboratory Operations Manual (current version)
- Trace Evidence Quality Manual (current version)
- Trace Evidence Procedures Manual (current version)
- Department of Justice Uniform Language for Testimony and Reports (ULTR) for the Forensic Geology Discipline (current version)

Rev.#	Issue Date	History
3	01/31/19	Removed Section 3 “Responsibilities”. Section 3.1 and 3.2 merged as Section 3, and all references to “Geologic Materials” changed to “Geologically-derived Materials” throughout entire document. “Geologically-derived Materials” defined in Scope. Section 4.1 and 4.2 merged to section 4. Sections 3 and 4 renumbered. Section headings added in Sections 3.1 through 3.4. Minor wording changes to Sections 3.1 through 3.4 to conform to Department of Justice Uniform Language for Testimony and Reports (ULTR) for the Forensic Geology Discipline wording. Section 3.5 wording modified. Sections 4.2, 4.3, and 4.6 through 4.10 added. Added reference to the Geology ULTR.
4	08/17/20	Extra spaces removed in Section 3.2. New Section 3.2 added. Previous sections 3.2 through 3.5 renumbered to 3.3 through 3.6. Sections 4.3 and 4.4 added. Previous sections 4.3 through 4.10 renumbered to 4.5 through 4.12. Updated Sections 4.6 and 4.7 for consistency. Additional prohibited phrases added to Section 4.12.

Approval

Redacted - Signatures on File

Trace Evidence Unit Chief — Date: 08/14/2020

Mineralogy Technical Leader — Date: 08/14/2020

QA Approval

Quality Manager — Date: 08/14/2020